

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 16 May 2000 (16.05.00)	
International application No. PCT/GB99/03089	Applicant's or agent's file reference HL70683/001/CIV
International filing date (day/month/year) 16 September 1999 (16.09.99)	Priority date (day/month/year) 18 September 1998 (18.09.98)
Applicant PHELPS, Richard, Carl et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
12 April 2000 (12.04.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Juan Cruz Telephone No.: (41-22) 338.83.38
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Copy for the Elected Office (EO/US)

PCT/GB99/03089

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE

(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

HASELTINE LAKE & CO.
Imperial House
15-19 Kingsway
London WC2B 6UD
ROYAUME-UNI

Date of mailing (day/month/year) 30 March 2001 (30.03.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference HL70683/001/CIV	
International application No. PCT/GB99/03089	International filing date (day/month/year) 16 September 1999 (16.09.99)

1. The following indications appeared on record concerning:

☒ the applicant ☐ the inventor ☐ the agent ☐ the common representative

Name and Address PIXELFUSION LIMITED 2440 The Quadrant Aztec West Almondsbury Bristol BS32 4AQ United Kingdom	State of Nationality GB	State of Residence GB
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person ☐ the name ☒ the address ☐ the nationality ☐ the residence

Name and Address PIXELFUSION LIMITED Wallscourt Farm Filton Road Bristol BS34 8RB United Kingdom	State of Nationality GB	State of Residence GB
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

☒ the receiving Office ☐ the designated Offices concerned
☐ the International Searching Authority ☒ the elected Offices concerned
☒ the International Preliminary Examining Authority ☐ other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer R. Chrem Telephone No.: (41-22) 338.83.38
---	--

CLAIMS

1. Apparatus for use in a computer system comprising:

a bus architecture;

5 a plurality of modules connected to the bus architecture, at least one module being latency tolerant and at least one module being latency intolerant, wherein the bus architecture comprises:

10 a primary bus having latency intolerant modules connected thereto;

a secondary bus having latency tolerant modules connected thereto; and

a primary to secondary bus interface module interconnecting the primary and secondary buses.

15 2. Apparatus as claimed in claim 1, wherein the length of the secondary bus is greater than that of the primary bus.

20 3. Apparatus as claimed in claim 2, wherein the primary bus is less than, or equal to, three pipeline stages in length.

25 4. Apparatus as claimed in claim 1, 2 or 3, wherein latency tolerant modules connected to the secondary bus are arranged such that the least tolerant modules are located closer to the primary bus than the more tolerant modules.

30 5. Apparatus as claimed in any one of the preceding claims, wherein the bus architecture has two or more secondary buses, each one connected to the primary bus via a separate primary to secondary interface module.

6. Apparatus as claimed in any one of claims 1 to 5, wherein the primary bus comprises:

a write data bus for transferring write data between modules;

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

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EE	Estonia						

REC'D 05 JAN 2001

WIPO

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference HL70683/001/CIV	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB99/03089	International filing date (day/month/year) 16/09/1999	Priority date (day/month/year) 18/09/1998
International Patent Classification (IPC) or national classification and IPC G06F13/40		
Applicant PIXELFUSION LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 6 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 12/04/2000	Date of completion of this report 03.01.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Juenger, B Telephone No. +49 89 2399 7485



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/03089

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:

Description, pages:

1-32 as originally filed

Claims, No.:

1-39 as originally filed

Claims, pages:

33 with telefax of 11/12/2000

Drawings, sheets:

1/16-16/16 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/03089

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☒ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
- ☒ not complied with for the following reasons:
see separate sheet

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☐ all parts.
- ☒ the parts relating to claims Nos. 1-27, 35-38 (35-38 in dependence on 1-27).

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/03089

Novelty (N)	Yes:	Claims	1-27, 35-38 (35-38 in dependence on 1-27)
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-27, 35-38 (35-38 in dependence on 1-27)
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-27, 35-38 (35-38 in dependence on 1-27)
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Reference is made to the following document:

D1: US-A-5 481 681 (GALLO ET AL) 2 January 1996 (1996-01-02)

Re Item IV

Lack of unity of invention

1 The International Examination Authority agrees with the objection put forward by the International Search Authority as to lack of unity (Rule 13.1 PCT), the reasons for the objection being as follows:

1.1 The general concept linking together independent claims 1, 28, 30, 34 is the following:

"providing efficient data transactions in a bus-based system"

This general concept is not novel, see document D1, Fig. 1 and abstract. Hence, independent claims 1, 28, 30, 34 are not so linked as to form a single general inventive concept.

1.2 The following inventions are detected:

- Claims 1-27 and their dependent claims 35-38 deal with a bus architecture comprising primary and secondary buses.
- Claims 28, 29 and their dependent claims 35-38 deal with an apparatus for determining device availability in a bus architecture.
- Claims 30-33, their dependent claims 35-38 and also claim 39 deal with a packet based arbitration method and apparatus for computer bus.
- Claim 34 and the dependent claims 35-38 deal with a data request matching apparatus.

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Document D1 is regarded as being the closest prior art source to the subject-matter of claim 1. This document shows the majority of the features of claim 1 (Fig. 1). Document D1 does not disclose that only latency intolerant modules are connected to the primary bus.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/03089

- 2 This solves the problem of avoiding a large number of modules on the primary bus thus, avoiding increasing module to module distance thus, avoiding increasing the transaction time and finally avoiding an adverse effect on latency.
- 3 The prior art documents do neither suggest nor render obvious to only connect latency intolerant modules to the primary bus as proposed in the solution of the present application.
- 4 Claims 2-27 and 35-38 are dependent on claim 1. As far as their dependency on claim 1 is concerned, these claims also meet the requirements of the PCT with respect to novelty and inventive step.

Re Item VII

Certain defects in the international application

- 1 Document D1 should have been acknowledged in the introductory part of the description (Rule 5.1(a)(ii) PCT)).

Re Item VIII

Certain observations on the international application

- 1 The independent claims are not in two-part form (Rule 6.3(b) PCT) using the words "characterized by", with those features which in combination are of the prior art being placed in the preamble.
- 2 The claims do not contain reference signs (Rule 6.2(b) PCT).

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

VIGARS, Christopher Ian
HASLTIME LAKE & CO.
Imperial House
15-19 Kingsway
London WC2B 6UD
GRANDE BRETAGNE

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1)

Date of mailing (day/month/year)	03.01.2001
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Applicant's or agent's file reference HL70683/001/CIV	IMPORTANT NOTIFICATION
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International application No. PCT/GB99/03089	International filing date (day/month/year) 16/09/1999	Priority date (day/month/year) 18/09/1998
---	--	--

Applicant PIXELFUSION LIMITED et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/	Authorized officer
---------------------------------------	--------------------



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Koski, P

Tel. +49 89 2399-2709



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference HL70683/001/CIV	FOR FURTHER ACTION		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/GB99/03089	International filing date (day/month/year) 16/09/1999	Priority date (day/month/year) 18/09/1998	
International Patent Classification (IPC) or national classification and IPC G06F13/40			
Applicant PIXELFUSION LIMITED et al.			


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2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 12/04/2000	Date of completion of this report 03.01.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Juenger, B Telephone No. +49 89 2399 7485



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/03089

I. Basis of the report

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Description, pages:

1-32 as originally filed

Claims, No.:

1-39 as originally filed

Claims, pages:

33 with telefax of 11/12/2000

Drawings, sheets:

1/16-16/16 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
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- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB99/03089

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☒ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
- ☒ not complied with for the following reasons:
see separate sheet

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☐ all parts.
- ☒ the parts relating to claims Nos. 1-27, 35-38 (35-38 in dependence on 1-27).

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB99/03089

Novelty (N)	Yes:	Claims	1-27, 35-38 (35-38 in dependence on 1-27)
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-27, 35-38 (35-38 in dependence on 1-27)
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-27, 35-38 (35-38 in dependence on 1-27)
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Reference is made to the following document:

D1: US-A-5 481 681 (GALLO ET AL) 2 January 1996 (1996-01-02)

Re Item IV

Lack of unity of invention

1 The International Examination Authority agrees with the objection put forward by the International Search Authority as to lack of unity (Rule 13.1 PCT), the reasons for the objection being as follows:

1.1 The general concept linking together independent claims 1, 28, 30, 34 is the following:

"providing efficient data transactions in a bus-based system"

This general concept is not novel, see document D1, Fig. 1 and abstract. Hence, independent claims 1, 28, 30, 34 are not so linked as to form a single general inventive concept.

1.2 The following inventions are detected:

- Claims 1-27 and their dependent claims 35-38 deal with a bus architecture comprising primary and secondary buses.
- Claims 28, 29 and their dependent claims 35-38 deal with an apparatus for determining device availability in a bus architecture.
- Claims 30-33, their dependent claims 35-38 and also claim 39 deal with a packet based arbitration method and apparatus for computer bus.
- Claim 34 and the dependent claims 35-38 deal with a data request matching apparatus.

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Document D1 is regarded as being the closest prior art source to the subject-matter of claim 1. This document shows the majority of the features of claim 1 (Fig. 1). Document D1 does not disclose that only latency intolerant modules are connected to the primary bus.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/03089

- 2 This solves the problem of avoiding a large number of modules on the primary bus thus, avoiding increasing module to module distance thus, avoiding increasing the transaction time and finally avoiding an adverse effect on latency.
- 3 The prior art documents do neither suggest nor render obvious to only connect latency intolerant modules to the primary bus as proposed in the solution of the present application.
- 4 Claims 2-27 and 35-38 are dependent on claim 1. As far as their dependency on claim 1 is concerned, these claims also meet the requirements of the PCT with respect to novelty and inventive step.

Re Item VII

Certain defects in the international application

- 1 Document D1 should have been acknowledged in the introductory part of the description (Rule 5.1(a)(ii) PCT)).

Re Item VIII

Certain observations on the international application

- 1 The independent claims are not in two-part form (Rule 6.3(b) PCT) using the words "characterized by", with those features which in combination are of the prior art being placed in the preamble.
- 2 The claims do not contain reference signs (Rule 6.2(b) PCT).

CLAIMS

1. Apparatus for use in a computer system comprising:

a bus architecture;

5 a plurality of modules connected to the bus architecture, at least one module being latency tolerant and at least one module being latency intolerant, wherein the bus architecture comprises:

10 a primary bus having only latency intolerant modules connected thereto;

a secondary bus having latency tolerant modules connected thereto; and

a primary to secondary bus interface module interconnecting the primary and secondary buses.

15 2. Apparatus as claimed in claim 1, wherein the length of the secondary bus is greater than that of the primary bus.

20 3. Apparatus as claimed in claim 2, wherein the primary bus is less than, or equal to, three pipeline stages in length.

25 4. Apparatus as claimed in claim 1, 2 or 3, wherein latency tolerant modules connected to the secondary bus are arranged such that the least tolerant modules are located closer to the primary bus than the more tolerant modules.

30 5. Apparatus as claimed in any one of the preceding claims, wherein the bus architecture has two or more secondary buses, each one connected to the primary bus via a separate primary to secondary interface module.

6. Apparatus as claimed in any one of claims 1 to 5, wherein the primary bus comprises:

a write data bus for transferring write data between modules;

PATENT COOPERATION TREATY

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

VIGARS, Christopher Ian
HASeltINE LAKE & CO.
Imperial House
15-19 Kingsway
London WC2B 6UD
GRANDE BRETAGNE

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing (day/month/year)	27.09.2000
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Applicant's or agent's file reference HL70683/001/CIV	REPLY DUE within 2 month(s) and 10 days from the above date of mailing
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International application No. PCT/GB99/03089	International filing date (day/month/year) 16/09/1999	Priority date (day/month/year) 18/09/1998
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International Patent Classification (IPC) or both national classification and IPC
G06F13/40

Applicant
PIXELFUSION LIMITED et al.

1. This written opinion is the first drawn up by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☒ Lack of unity of invention
 - V ☐ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain document cited
 - VII ☒ Certain defects in the international application
 - VIII ☒ Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.


When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 18/01/2001.

Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer / Examiner Juenger, B Formalities officer (incl. extension of time limits) Koski, P Telephone No. +49 89 2399 2709
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I. Basis of the opinion

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".*):

Description, pages:

1-32 as originally filed

Claims, No.:

1-39 as originally filed

Drawings, sheets:

1/16-16/16 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been and will not be examined in respect of:

- ☐ the entire international application,
☒ claims Nos. 1-27,35-38,

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

- ☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 1 are so unclear that no meaningful opinion could be formed (*specify*):

see separate sheet

- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☐ no international search report has been established for the said claims Nos. .

IV. Lack of unity of invention

1. In response to the invitation (Form PCT/IPEA/405) to restrict or pay additional fees, the applicant has:

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☒ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with for the following reasons and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees:

3. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this opinion:

- ☐ all parts.
- ☒ the parts relating to claims Nos. 1-27, 35-38 (35-38 in dependence on 1-27).

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Reference is made to the following document:

D1: US-A-5 481 681 (GALLO ET AL) 2 January 1996 (1996-01-02)

Re Item IV

Lack of unity of invention

1 The International Examination Authority agrees with the objection put forward by the International Search Authority as to lack of unity (Rule 13.1 PCT), the reasons for the objection being as follows:

1.1 The general concept linking together independent claims 1, 28, 30, 34 is the following:

"providing efficient data transactions in a bus-based system"

This general concept is not novel, see document D1, Fig. 1 and abstract. Hence, independent claims 1, 28, 30, 34 are not so linked as to form a single general inventive concept.

1.2 The following inventions are detected:

- Claims 1-27 and their dependent claims 35-38 deal with a bus architecture comprising primary and secondary buses.
- Claims 28, 29 and their dependent claims 35-38 deal with an apparatus for determining device availability in a bus architecture.
- Claims 30-33, their dependent claims 35-38 and also claim 39 deal with a packet based arbitration method and apparatus for computer bus.
- Claim 34 and the dependent claims 35-38 deal with a data request matching apparatus.

Re Item VII

Certain defects in the international application

- 1 Document D1 is regarded as being the closest prior art source to the subject-matter of claim 1. Insofar as claim 1 can be understood (see section VIII) this document shows the majority of the features of claim 1 (Fig. 1). Document D1 does not disclose that only latency intolerant modules are connected to the primary bus. D1 is not acknowledged in the introductory part of the description (Rule 5.1(a)(ii) PCT)).

Re Item VIII

Certain observations on the international application

- 1 It is clear from the description (page 1, line 34- page 2, line 5 and page 11, lines 1-26), that increasing the number of modules connected to a bus leads to increasing module to module distance which increases the transaction time and also has an adverse effect on latency. It is also clear from the description (page 10, lines 14-20) that the number of modules connected to a primary bus can be reduced by only connecting latency intolerant modules to the primary bus.

Consequently, the following feature is essential to the definition of the invention:

- a primary bus having only latency intolerant modules connected thereto

Since independent claim 1 does not contain this feature it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

- 2 The independent claims are not in two-part form (Rule 6.3(b) PCT) using the words "characterized by", with those features which in combination are of the prior art being placed in the preamble.
- 3 The claims do not contain reference signs (Rule 6.2(b) PCT).

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference HL70683/001/CIV	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 99/ 03089	International filing date (day/month/year) 16/09/1999	(Earliest) Priority Date (day/month/year) 18/09/1998
Applicant PIXELFUSION LIMITED et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 5 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

COMPUTER SYSTEM COMPRISING LATENCY TOLERANT AND INTOLERANT MODULES

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☒ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

2

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No.

CT/GB 99/03089

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06F13/40 G06F13/362

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 481 681 A (GALLO ET AL) 2 January 1996 (1996-01-02) column 2, line 54 -column 3, line 50; figures 1,2 column 5, line 45 -column 7, line 37; figures 9,10 ---	1-13, 16-18
A	US 5 450 547 A (NGUYEN ET AL) 12 September 1995 (1995-09-12) column 1, line 62 -column 5, line 7; figures 1,2 ---	1-13, 16-18
A	US 5 541 932 A (NGUYEN ET AL) 30 July 1996 (1996-07-30) column 2, line 44 -column 3, line 67; figure 1 --- -/--	1-13, 16-18

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

9 June 2000

Date of mailing of the international search report

21.06.2000

Name and mailing address of the ISA

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Authorized officer

Gill, S

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/03089

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 669 079 A (BLUM ARNOLD) 26 May 1987 (1987-05-26) column 2, line 11 - line 28 column 2, line 49 - column 3, line 14; figure 1 claim 1 ---	28, 29, 35-38
X	EP 0 048 869 A (SIEMENS AG) 7 April 1982 (1982-04-07) page 6, line 14 - page 8, line 5; figure 1 ---	28, 29, 35-38
X	US 4 709 364 A (HASEGAWA TOSHIHARU ET AL) 24 November 1987 (1987-11-24) column 1, line 16 - column 3, line 26 ---	30-33, 35-38
A	US 4 488 232 A (SWANEY RICHARD E ET AL) 11 December 1984 (1984-12-11) column 3, line 34 - column 4, line 31; figure 1 ---	30-33, 35-38
X	WO 80 01421 A (SULLIVAN COMPUTER CORP.) 10 July 1980 (1980-07-10) page 5, paragraph 2 - page 8, paragraph 5; figures 1, 2 ---	34-38
X	US 5 375 215 A (HANAWA ET AL) 20 December 1994 (1994-12-20) column 2, line 28 - line 59; figures 1, 8 -----	34-38

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 99/03089

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5481681	A	02-01-1996	AU 625687 B AU 4798190 A BR 9000887 A CA 2007737 A,C DE 69030678 D DE 69030678 T EP 0384621 A JP 1905979 C JP 2297116 A JP 6028049 B	16-07-1992 30-08-1990 13-02-1991 24-08-1990 19-06-1997 08-01-1998 29-08-1990 24-02-1995 07-12-1990 13-04-1994
US 5450547	A	12-09-1995	NONE	
US 5541932	A	30-07-1996	NONE	
US 4669079	A	26-05-1987	EP 0179936 A DE 3480962 D JP 61109164 A	07-05-1986 08-02-1990 27-05-1986
EP 0048869	A	07-04-1982	DE 3036911 A	13-05-1982
US 4709364	A	24-11-1987	JP 1816430 C JP 5028541 B JP 61033043 A JP 61033044 A JP 1816431 C JP 5028542 B JP 61033045 A	18-01-1994 26-04-1993 15-02-1986 15-02-1986 18-01-1994 26-04-1993 15-02-1986
US 4488232	A	11-12-1984	CA 1186767 A DE 3279575 D EP 0076401 A ES 516142 D ES 8306897 A IL 66800 A JP 58132823 A NO 823319 A,B,	07-05-1985 27-04-1989 13-04-1983 01-06-1983 16-09-1983 31-05-1985 08-08-1983 05-04-1983
WO 8001421	A	10-07-1980	AT 16426 T CA 1138119 A DE 3071216 D EP 0023213 A JP 4008824 B JP 56500153 T US 4484262 A US 4707781 A	15-11-1985 21-12-1982 12-12-1985 04-02-1981 18-02-1992 12-02-1981 20-11-1984 17-11-1987
US 5375215	A	20-12-1994	JP 4175943 A	23-06-1992

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 99/03089

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-27,35-38 (35-38 in dependence on 1-27)

Bus architecture comprising primary and secondary buses

2. Claims: 28,29,
35-38 (claims 35-38 in dependence on 28 and 29)

Apparatus for determining device availability in a bus architecture

3. Claims: 30-33, 35-39 (claims 35-38 in dependence on 30-33)

Packet based arbitration method and apparatus for computer bus

4. Claims: 34-38 (claims 35-38 in dependence on 34)

Data request matching apparatus